

SEQUENCE LISTING

<110> Ting, Alice Y
 <120> METHODS AND COMPOSITIONS FOR PEPTIDE AND PROTEIN LABELING
 <130> M0656.70088US01
 <140> not yet assigned
 <141> 2004-01-09
 <150> US 60/438,939
 <151> 2003-01-09
 <160> 21
 <170> PatentIn version 3.2
 <210> 1
 <211> 321
 <212> PRT
 <213> Escherichia coli Bir A
 <400> 1

Met	Lys	Asp	Asn	Thr	Val	Pro	Leu	Lys	Leu	Ile	Ala	Leu	Leu	Ala	Asn	1		5		10				15
Gly	Glu	Phe	His	Ser	Gly	Glu	Gln	Leu	Gly	Glu	Thr	Leu	Gly	Met	Ser		20		25				30	
Arg	Ala	Ala	Ile	Asn	Lys	His	Ile	Gln	Thr	Leu	Arg	Asp	Trp	Gly	Val		35		40			45		
Asp	Val	Phe	Thr	Val	Pro	Gly	Lys	Gly	Tyr	Ser	Leu	Pro	Glu	Pro	Ile	50		55			60			
Gln	Leu	Leu	Asn	Ala	Lys	Gln	Ile	Leu	Gly	Gln	Leu	Asp	Gly	Gly	Ser	65		70			75			80
Val	Ala	Val	Leu	Pro	Val	Ile	Asp	Ser	Thr	Asn	Gln	Tyr	Leu	Leu	Asp		85		90				95	
Arg	Ile	Gly	Glu	Leu	Lys	Ser	Gly	Asp	Ala	Cys	Ile	Ala	Glu	Tyr	Gln		100		105				110	
Gln	Ala	Gly	Arg	Gly	Arg	Arg	Gly	Arg	Lys	Trp	Phe	Ser	Pro	Phe	Gly		115		120			125		
Ala	Asn	Leu	Tyr	Leu	Ser	Met	Phe	Trp	Arg	Leu	Glu	Gln	Gly	Pro	Ala		130		135			140		
Ala	Ala	Ile	Gly	Leu	Ser	Leu	Val	Ile	Gly	Ile	Val	Met	Ala	Glu	Val	145		150			155			160
Leu	Arg	Lys	Leu	Gly	Ala	Asp	Lys	Val	Arg	Val	Lys	Trp	Pro	Asn	Asp		165		170				175	
Leu	Tyr	Leu	Gln	Asp	Arg	Lys	Leu	Ala	Gly	Ile	Leu	Val	Glu	Leu	Thr		180		185				190	

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
 195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
 210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
 225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
 245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
 260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
 275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
 290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
 305 310 315 320

Lys

<210> 2
 <211> 966
 <212> DNA
 <213> Escherichia coli Bir A

<400> 2

atgaaggata acaccgtgcc actgaaattg attgccctgt tagcgaacgg tgaatttcac	60
tctggcgagc agttgggtga aacgctggga atgagccggg cggctattaa taaacacatt	120
cagacactgc gtgactgggg cggttgatgtc tttaccgttc cgggtaaagg atacagcctg	180
cctgagccta tccagttact taatgctaaa cagatattgg gtcagctgga tggcggtagt	240
gtagccgtgc tgccagtgat tgactccacg aatcagtacc ttcttgatcg tatcggagag	300
cttaaatecg gcgatgcttg cattgcagaa taccagcagg ctggccgtgg tcgccgggggt	360
cggaaatggg tttcgctttt tggcgcaaac ttatatattgt cgatgttctg gcgtctggaa	420
caaggcccgg cggcggcgat tggtttaagt ctggttatcg gtatcgtgat ggcggaagta	480
ttacgcaagc tgggtgcaga taaagttcgt gttaaattggc ctaatgacct ctatctgcag	540
gatcgcaagc tggcaggcat tctggtggag ctgactggca aaactggcga tgcggcgcaa	600
atagtcattg gagccgggat caacatggca atgcgccgtg ttgaagagag tgtcggtaat	660
caggggtgga tcacgctgca ggaagcgggg atcaatctcg atcgtaatac gttggcggcc	720
atgctaatac gtgaattacg tgctgcgttg gaactcttcg aacaagaagg attggcacct	780
tatctgtcgc gctgggaaaa gctggataat tttattaatc gccagtgaa acttatcatt	840

ggtgataaag aaatatttgg catttcacgc ggaatagaca aacaggggggc tttattactt 900
gagcaggatg gaataataaa accctggatg ggcggtgaaa tatccctgcg tagtgcagaa 960
aaataa 966

<210> 3
<211> 13
<212> PRT
<213> Escherichia coli

<220>
<221> MISC_FEATURE
<222> (2)..(2)
<223> Xaa is any amino acid

<220>
<221> MISC_FEATURE
<222> (3)..(3)
<223> Xaa is Asp, Glu, Asn, Gln, Ser, Thr, Gly, Ala, Pro, Met or Cys

<220>
<221> MISC_FEATURE
<222> (5)..(5)
<223> Xaa is Phe or Leu

<220>
<221> MISC_FEATURE
<222> (6)..(6)
<223> Xaa is Glu or Asp

<220>
<221> MISC_FEATURE
<222> (7)..(7)
<223> Xaa is Ala, Gly, Ser, or Thr

<220>
<221> MISC_FEATURE
<222> (8)..(8)
<223> Xaa is Gln, or Met

<220>
<221> MISC_FEATURE
<222> (10)..(10)
<223> Xaa is Ile, Met, or Val

<220>
<221> MISC_FEATURE
<222> (11)..(11)
<223> Xaa is Glu, Leu, Val, Tyr, or Ile

<220>
<221> MISC_FEATURE
<222> (12)..(12)
<223> Xaa is Trp, Tyr, Val, Phe, Leu, or Ile

<220>
<221> MISC_FEATURE
<222> (13)..(13)
<223> Xaa is Asn, Gln, Ser, Thr, Tyr, Gly, Ala, Val, Leu, Ile, Pro, Phe, Met, Trp, or Cys

<400> 3

Leu Xaa Xaa Ile Xaa Xaa Xaa Xaa Lys Xaa Xaa Xaa Xaa
1 5 10

<210> 4

<211> 13

<212> PRT

<213> Artificial sequence

<220>

<223> Oligonucleotide

<400> 4

Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His
1 5 10

<210> 5

<211> 15

<212> PRT

<213> Artificial sequence

<220>

<223> Oligonucleotide

<400> 5

Gly Leu Asn Asp Ile Phe Glu Ala Gln Lys Ile Glu Trp His Glu
1 5 10 15

<210> 6

<211> 321

<212> PRT

<213> Escherichia coli

<400> 6

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Gly Asn Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 7
<211> 321
<212> PRT
<213> Escherichia coli

<400> 7

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Gly Ser Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 8
<211> 321
<212> PRT
<213> Escherichia coli

<220>
<221> MISC_FEATURE

<222> (83)..(83)
<223> Xaa is Val, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (89)..(89)
<223> Xaa is Ser, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (90)..(90)
<223> Xaa is Thr, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (91)..(91)
<223> Xaa is Asn, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (92)..(92)
<223> Xaa is Gln, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (107)..(107)
<223> Xaa is Cys, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (112)..(112)
<223> Xaa is Gln, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (115)..(115)
<223> Xaa is Gly, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (116)..(116)
<223> Xaa is Arg, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (117)..(117)
<223> Xaa is Gly, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (118)..(118)
<223> Xaa is Arg, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (123)..(123)
<223> Xaa is Trp, or any other amino acid

<220>
<221> MISC_FEATURE
<222> (132)..(132)
<223> Xaa is Tyr, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (134)..(134)
 <223> Xaa is Ser, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (142)..(142)
 <223> Xaa is Gly, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (186)..(186)
 <223> Xaa is Gly, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (188)..(188)
 <223> Xaa is Leu, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (189)..(189)
 <223> Xaa is Val, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (190)..(190)
 <223> Xaa is Glu, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (204)..(204)
 <223> Xaa is Gly, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (206)..(206)
 <223> Xaa is Gly, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (207)..(207)
 <223> Xaa is Ile, or any other amino acid

<220>
 <221> MISC_FEATURE
 <222> (235)..(235)
 <223> Xaa is Arg, or any other amino acid

<400> 8

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
 1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
 20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
 35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Xaa Leu Pro Val Ile Asp Xaa Xaa Xaa Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Xaa Ile Ala Glu Tyr Xaa
100 105 110

Gln Ala Xaa Xaa Xaa Xaa Arg Gly Arg Lys Xaa Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Xaa Leu Xaa Met Phe Trp Arg Leu Glu Gln Xaa Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Xaa Ile Xaa Xaa Xaa Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Xaa Ala Xaa Xaa Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Xaa Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 9
<211> 321
<212> PRT
<213> Escherichia coli

<220>
<221> MISC_FEATURE

<222> (90)..(90)

<223> Xaa is Gly, Ala, or Val

<400> 9

Met	Lys	Asp	Asn	Thr	Val	Pro	Leu	Lys	Leu	Ile	Ala	Leu	Leu	Ala	Asn	
1				5					10					15		
Gly	Glu	Phe	His	Ser	Gly	Glu	Gln	Leu	Gly	Glu	Thr	Leu	Gly	Met	Ser	
			20				25						30			
Arg	Ala	Ala	Ile	Asn	Lys	His	Ile	Gln	Thr	Leu	Arg	Asp	Trp	Gly	Val	
		35					40					45				
Asp	Val	Phe	Thr	Val	Pro	Gly	Lys	Gly	Tyr	Ser	Leu	Pro	Glu	Pro	Ile	
	50					55					60					
Gln	Leu	Leu	Asn	Ala	Lys	Gln	Ile	Leu	Gly	Gln	Leu	Asp	Gly	Gly	Ser	
65					70					75					80	
Val	Ala	Val	Leu	Pro	Val	Ile	Asp	Ser	Xaa	Asn	Gln	Tyr	Leu	Leu	Asp	
				85					90					95		
Arg	Ile	Gly	Glu	Leu	Lys	Ser	Gly	Asp	Ala	Cys	Ile	Ala	Glu	Tyr	Gln	
			100					105					110			
Gln	Ala	Gly	Arg	Gly	Arg	Arg	Gly	Arg	Lys	Trp	Phe	Ser	Pro	Phe	Gly	
		115					120					125				
Ala	Asn	Leu	Tyr	Leu	Ser	Met	Phe	Trp	Arg	Leu	Glu	Gln	Gly	Pro	Ala	
	130					135					140					
Ala	Ala	Ile	Gly	Leu	Ser	Leu	Val	Ile	Gly	Ile	Val	Met	Ala	Glu	Val	
145					150					155					160	
Leu	Arg	Lys	Leu	Gly	Ala	Asp	Lys	Val	Arg	Val	Lys	Trp	Pro	Asn	Asp	
			165						170					175		
Leu	Tyr	Leu	Gln	Asp	Arg	Lys	Leu	Ala	Gly	Ile	Leu	Val	Glu	Leu	Thr	
			180					185					190			
Gly	Lys	Thr	Gly	Asp	Ala	Ala	Gln	Ile	Val	Ile	Gly	Ala	Gly	Ile	Asn	
		195					200					205				
Met	Ala	Met	Arg	Arg	Val	Glu	Glu	Ser	Val	Val	Asn	Gln	Gly	Trp	Ile	
	210					215					220					
Thr	Leu	Gln	Glu	Ala	Gly	Ile	Asn	Leu	Asp	Arg	Asn	Thr	Leu	Ala	Ala	
225					230					235					240	
Met	Leu	Ile	Arg	Glu	Leu	Arg	Ala	Ala	Leu	Glu	Leu	Phe	Glu	Gln	Glu	
			245						250					255		
Gly	Leu	Ala	Pro	Tyr	Leu	Ser	Arg	Trp	Glu	Lys	Leu	Asp	Asn	Phe	Ile	
			260					265					270			
Asn	Arg	Pro	Val	Lys	Leu	Ile	Ile	Gly	Asp	Lys	Glu	Ile	Phe	Gly	Ile	
		275					280					285				
Ser	Arg	Gly	Ile	Asp	Lys	Gln	Gly	Ala	Leu	Leu	Leu	Glu	Gln	Asp	Gly	
	290					295					300					

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 10
<211> 321
<212> PRT
<213> Escherichia coli

<220>
<221> MISC_FEATURE
<222> (90)..(90)
<223> Xaa is Gly, Ala, or Val

<220>
<221> MISC_FEATURE
<222> (91)..(91)
<223> Xaa is Ser, Gly, Ala, or Leu

<400> 10

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Xaa Xaa Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
 210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
 225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
 245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
 260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
 275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
 290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
 305 310 315 320

Lys

<210> 11
 <211> 321
 <212> PRT
 <213> Escherichia coli

<400> 11

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
 1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
 20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
 35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
 50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
 65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Gly Gly Gln Tyr Leu Leu Asp
 85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
 100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
 115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
 130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
 145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
 165 170 175
 Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
 180 185 190
 Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
 195 200 205
 Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
 210 215 220
 Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
 225 230 235 240
 Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
 245 250 255
 Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
 260 265 270
 Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
 275 280 285
 Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
 290 295 300
 Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
 305 310 315 320
 Lys

<210> 12
 <211> 321
 <212> PRT
 <213> Escherichia coli
 <400> 12

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
 1 5 10 15
 Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
 20 25 30
 Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
 35 40 45
 Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
 50 55 60
 Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
 65 70 75 80
 Val Ala Val Leu Pro Val Ile Asp Ser Ala Ala Gln Tyr Leu Leu Asp
 85 90 95
 Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
 100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 13
<211> 321
<212> PRT
<213> Escherichia coli

<400> 13

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Ala Leu Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 14
<211> 321
<212> PRT
<213> Escherichia coli

<400> 14

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

[illegible]

<210> 15
 <211> 321
 <212> PRT
 <213> Escherichia coli

<400> 15

Met	Lys	Asp	Asn	Thr	Val	Pro	Leu	Lys	Leu	Ile	Ala	Leu	Leu	Ala	Asn
1				5					10					15	
Gly	Glu	Phe	His	Ser	Gly	Glu	Gln	Leu	Gly	Glu	Thr	Leu	Gly	Met	Ser
			20				25						30		
Arg	Ala	Ala	Ile	Asn	Lys	His	Ile	Gln	Thr	Leu	Arg	Asp	Trp	Gly	Val
		35					40					45			
Asp	Val	Phe	Thr	Val	Pro	Gly	Lys	Gly	Tyr	Ser	Leu	Pro	Glu	Pro	Ile
	50					55					60				
Gln	Leu	Leu	Asn	Ala	Lys	Gln	Ile	Leu	Gly	Gln	Leu	Asp	Gly	Gly	Ser
65					70					75					80
Val	Ala	Val	Leu	Pro	Val	Ile	Asp	Ser	Thr	Asn	Gln	Tyr	Leu	Leu	Asp
				85					90					95	
Arg	Ile	Gly	Glu	Leu	Lys	Ser	Gly	Asp	Ala	Cys	Ile	Ala	Glu	Tyr	Met
			100					105						110	
Gln	Ala	Gly	Arg	Gly	Arg	Arg	Gly	Arg	Lys	Trp	Phe	Ser	Pro	Phe	Gly
		115					120					125			
Ala	Asn	Leu	Tyr	Leu	Ser	Met	Phe	Trp	Arg	Leu	Glu	Gln	Gly	Pro	Ala
	130					135					140				
Ala	Ala	Ile	Gly	Leu	Ser	Leu	Val	Ile	Gly	Ile	Val	Met	Ala	Glu	Val
145					150					155					160
Leu	Arg	Lys	Leu	Gly	Ala	Asp	Lys	Val	Arg	Val	Lys	Trp	Pro	Asn	Asp
			165					170						175	
Leu	Tyr	Leu	Gln	Asp	Arg	Lys	Leu	Ala	Gly	Ile	Leu	Val	Glu	Leu	Thr
		180					185						190		
Gly	Lys	Thr	Gly	Asp	Ala	Ala	Gln	Ile	Val	Ile	Gly	Ala	Gly	Ile	Asn
		195					200					205			
Met	Ala	Met	Arg	Arg	Val	Glu	Glu	Ser	Val	Val	Asn	Gln	Gly	Trp	Ile
	210					215					220				
Thr	Leu	Gln	Glu	Ala	Gly	Ile	Asn	Leu	Asp	Arg	Asn	Thr	Leu	Ala	Ala
225					230					235					240
Met	Leu	Ile	Arg	Glu	Leu	Arg	Ala	Ala	Leu	Glu	Leu	Phe	Glu	Gln	Glu
			245						250					255	
Gly	Leu	Ala	Pro	Tyr	Leu	Ser	Arg	Trp	Glu	Lys	Leu	Asp	Asn	Phe	Ile
			260					265					270		
Asn	Arg	Pro	Val	Lys	Leu	Ile	Ile	Gly	Asp	Lys	Glu	Ile	Phe	Gly	Ile
		275					280					285			

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 16

<211> 321

<212> PRT

<213> Escherichia coli

<400> 16

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Thr Asn Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Ala Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 17
<211> 321
<212> PRT
<213> Escherichia coli

<400> 17

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Thr Asn Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Gly Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
 195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
 210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
 225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
 245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
 260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
 275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
 290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
 305 310 315 320

Lys

<210> 18
 <211> 321
 <212> PRT
 <213> Escherichia coli

<400> 18

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
 1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
 20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
 35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
 50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
 65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Thr Asn Gln Tyr Leu Leu Asp
 85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
 100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
 115 120 125

Ala Asn Leu Ala Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
 130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
 145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
 165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
 180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
 195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
 210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
 225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
 245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
 260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
 275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
 290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
 305 310 315 320

Lys

<210> 19
 <211> 321
 <212> PRT
 <213> Escherichia coli

<400> 19

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
 1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
 20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
 35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
 50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
 65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Thr Asn Gln Tyr Leu Leu Asp
 85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Gly Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Val Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 20
<211> 321
<212> PRT
<213> Escherichia coli

<400> 20

Met Lys Asp Asn Thr Val Pro Leu Lys Leu Ile Ala Leu Leu Ala Asn
1 5 10 15

Gly Glu Phe His Ser Gly Glu Gln Leu Gly Glu Thr Leu Gly Met Ser
20 25 30

Arg Ala Ala Ile Asn Lys His Ile Gln Thr Leu Arg Asp Trp Gly Val
35 40 45

Asp Val Phe Thr Val Pro Gly Lys Gly Tyr Ser Leu Pro Glu Pro Ile
50 55 60

Gln Leu Leu Asn Ala Lys Gln Ile Leu Gly Gln Leu Asp Gly Gly Ser
65 70 75 80

Val Ala Val Leu Pro Val Ile Asp Ser Thr Asn Gln Tyr Leu Leu Asp
85 90 95

Arg Ile Gly Glu Leu Lys Ser Gly Asp Ala Cys Ile Ala Glu Tyr Gln
100 105 110

Gln Ala Gly Arg Gly Arg Arg Gly Arg Lys Trp Phe Ser Pro Phe Gly
115 120 125

Ala Asn Leu Tyr Leu Ser Met Phe Trp Arg Leu Glu Gln Gly Pro Ala
130 135 140

Ala Ala Ile Gly Leu Ser Leu Val Ile Gly Ile Val Met Ala Glu Val
145 150 155 160

Leu Arg Lys Leu Gly Ala Asp Lys Val Arg Val Lys Trp Pro Asn Asp
165 170 175

Leu Tyr Leu Gln Asp Arg Lys Leu Ala Gly Ile Leu Gly Glu Leu Thr
180 185 190

Gly Lys Thr Gly Asp Ala Ala Gln Ile Val Ile Gly Ala Gly Ile Asn
195 200 205

Met Ala Met Arg Arg Val Glu Glu Ser Val Val Asn Gln Gly Trp Ile
210 215 220

Thr Leu Gln Glu Ala Gly Ile Asn Leu Asp Arg Asn Thr Leu Ala Ala
225 230 235 240

Met Leu Ile Arg Glu Leu Arg Ala Ala Leu Glu Leu Phe Glu Gln Glu
245 250 255

Gly Leu Ala Pro Tyr Leu Ser Arg Trp Glu Lys Leu Asp Asn Phe Ile
260 265 270

Asn Arg Pro Val Lys Leu Ile Ile Gly Asp Lys Glu Ile Phe Gly Ile
275 280 285

Ser Arg Gly Ile Asp Lys Gln Gly Ala Leu Leu Leu Glu Gln Asp Gly
290 295 300

Ile Ile Lys Pro Trp Met Gly Gly Glu Ile Ser Leu Arg Ser Ala Glu
305 310 315 320

Lys

<210> 21
<211> 321
<212> PRT
<213> Escherichia coli

<400> 21

Met	Lys	Asp	Asn	Thr	Val	Pro	Leu	Lys	Leu	Ile	Ala	Leu	Leu	Ala	Asn	
1				5					10					15		
Gly	Glu	Phe	His	Ser	Gly	Glu	Gln	Leu	Gly	Glu	Thr	Leu	Gly	Met	Ser	
			20					25					30			
Arg	Ala	Ala	Ile	Asn	Lys	His	Ile	Gln	Thr	Leu	Arg	Asp	Trp	Gly	Val	
		35					40					45				
Asp	Val	Phe	Thr	Val	Pro	Gly	Lys	Gly	Tyr	Ser	Leu	Pro	Glu	Pro	Ile	
	50					55				60						
Gln	Leu	Leu	Asn	Ala	Lys	Gln	Ile	Leu	Gly	Gln	Leu	Asp	Gly	Gly	Ser	
65					70					75					80	
Val	Ala	Val	Leu	Pro	Val	Ile	Asp	Ser	Thr	Asn	Gln	Tyr	Leu	Leu	Asp	
				85					90					95		
Arg	Ile	Gly	Glu	Leu	Lys	Ser	Gly	Asp	Ala	Cys	Ile	Ala	Glu	Tyr	Gln	
			100					105					110			
Gln	Ala	Gly	Arg	Gly	Arg	Arg	Gly	Arg	Lys	Trp	Phe	Ser	Pro	Phe	Gly	
		115					120					125				
Ala	Asn	Leu	Tyr	Leu	Ser	Met	Phe	Trp	Arg	Leu	Glu	Gln	Gly	Pro	Ala	
	130					135					140					
Ala	Ala	Ile	Gly	Leu	Ser	Leu	Val	Ile	Gly	Ile	Val	Met	Ala	Glu	Val	
145					150					155					160	
Leu	Arg	Lys	Leu	Gly	Ala	Asp	Lys	Val	Arg	Val	Lys	Trp	Pro	Asn	Asp	
				165					170					175		
Leu	Tyr	Leu	Gln	Asp	Arg	Lys	Leu	Ala	Gly	Ile	Leu	Val	Glu	Leu	Thr	
			180					185					190			
Gly	Lys	Thr	Gly	Asp	Ala	Ala	Gln	Ile	Val	Ile	Gly	Ala	Gly	Ser	Asn	
		195					200					205				
Met	Ala	Met	Arg	Arg	Val	Glu	Glu	Ser	Val	Val	Asn	Gln	Gly	Trp	Ile	
	210					215					220					
Thr	Leu	Gln	Glu	Ala	Gly	Ile	Asn	Leu	Asp	Arg	Asn	Thr	Leu	Ala	Ala	
225					230					235					240	
Met	Leu	Ile	Arg	Glu	Leu	Arg	Ala	Ala	Leu	Glu	Leu	Phe	Glu	Gln	Glu	
				245					250					255		
Gly	Leu	Ala	Pro	Tyr	Leu	Ser	Arg	Trp	Glu	Lys	Leu	Asp	Asn	Phe	Ile	
			260					265					270			
Asn	Arg	Pro	Val	Lys	Leu	Ile	Ile	Gly	Asp	Lys	Glu	Ile	Phe	Gly	Ile	
		275					280					285				
Ser	Arg	Gly	Ile	Asp	Lys	Gln	Gly	Ala	Leu	Leu	Leu	Glu	Gln	Asp	Gly	
	290					295					300					
Ile	Ile	Lys	Pro	Trp	Met	Gly	Gly	Glu	Ile	Ser	Leu	Arg	Ser	Ala	Glu	
305					310					315					320	

Lys